

CUMULUS

SEASON 2023/2024

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14 March 2024



YOUNG PEOPLE SEE THE FUTURE *Differently*

“THE FUTURE OF AGRICULTURE... A CERTAIN FUTURE”



Contents

Summary.....	3
Hot and dry over most parts, but thundershowers expected next week.....	3
Overview of expected conditions over the main agricultural production areas	4
Daily summary of expected conditions.....	7
Medium term rainfall and temperature summary	10
Possible extreme conditions - relevant to agriculture.....	11
Seasonal forecast	12
Current ENSO conditions:.....	12
Seasonal forecasts issued by various international institutions	15
CUMULUS seasonal outlook	17
Observed conditions	18
Rainfall (% of long-term mean): January 2024.....	18
Rainfall (mm): 1 – 12 March 2024.....	19
Rainfall (% of Long-term mean): 16 January – 12 March 2024.....	20
Vegetation Condition Index: Late January 2024	21
Soil moisture conditions	22
Sources of information.....	23

Summary

Hot and dry over most parts, but thundershowers expected next week

Tropical storm Filipo moved south over Mozambique early this week, associated with heavy rain over the southern parts of that country. In South Africa, rain associated with the system was mostly limited to the escarpment and lowveld of Limpopo and Mpumalanga, with some significant totals over the southern parts of the Lowveld. Moving out, the system also caused significant rainfall over the far north-eastern parts of KZN.

Hot, dry weather continued over the interior as the system (Filipo) moved south to the east of South Africa. It will remain mostly hot and dry until at least early next week as an upper-air high will dominate the country. While there will not be a major shift in atmospheric circulation patterns, some upper-air instability over the interior coupled with a weak ridging high to the south feeding moisture into the interior will result in isolated to scattered thundershowers according to current forecasts from Monday onwards over the central to eastern parts. This will also include the summer-grain production region. Totals will for the most part remain below 25 mm of rain, but there will be localized areas receiving more rain. Given the dry conditions over the interior, it is more likely that the thundershowers will underperform. At this stage, rain during the latter part of March will likely be more advantageous for soil moisture content and grazing than for the crops over the central parts of the country.

Looking further ahead, a strong upper-air low may move over the southern parts of the country late next week. Current forecasts suggest a line of thundershowers over the interior ahead of the system, but cool, dry air may move in from the west again as the system moves across the country, again re-in forcing the dry signal over the country. It is a system that should be monitored as some changes in position and intensity of the system could result in a significant influx of cold air over the country, associated with frost.

Despite the expectation of thundershowers next week, large-scale circulation patterns remain unfavorable for widespread rain over the southern African region, with the position of long-wave troughs in the westerlies over the Atlantic and Indian Ocean not conducive to the flow of moisture into southern Africa. There is not yet an indication of a change to this pattern. However, a positive trend in the Southern Oscillation Index is still indicative of change in atmospheric circulation patterns and a potential trend towards wetter conditions later this month. The behavior of the upper-air trough late next week will be an indication of a pattern shift if it causes widespread rainfall over the interior. However, current forecasts are leaning towards a re-introduction of cool, dry air into the interior as the system moves through. The situation will be monitored.

The following is a summary of weather conditions during the next few days:

- Temperatures will be above normal over the interior.
- It will be hot to very hot at times over most of the interior.
- It will also be hot over the winter rainfall region at times.
- Rainfall will be near normal to below normal over most of the interior, but above-normal over the far eastern and far northeastern parts.
- The winter rainfall region will be mostly dry while light showers are possible along the Garden Route at times.
- It will be warm to hot and dry over the central interior, including the western to central parts of the summer-grain production region until early next week.
- Scattered thundershowers are possible initially over the far eastern and northeastern parts of the country, including the central to eastern parts of Mpumalanga and Limpopo together with the northern parts of KZN.
- Isolated to scattered thundershowers will occur over the interior, including the summer-grain production region, from late Sunday or Monday onwards.
- Temperatures over the interior, where it is expected to be hot until Monday, will moderate during next week with more extensive cloud cover expected according to current forecasts.
- **The winter rainfall region** will be dry except for light showers in the southwest on Saturday. It will become hot over the western to northern parts of the region from Sunday onwards. Light showers are expected over the Garden Route by Tuesday. Strong south-easterlies will occur over the southwestern parts from Sunday into next week.
- **The summer-grain production region** will be warm to hot and dry until Monday, except for scattered thundershowers expected over the far eastern parts Today (Thursday). Maximum temperatures over the western to central parts will remain in the mid-to upper-30s from Friday through the weekend until Monday. Isolated to scattered thundershowers are expected over the region by early next week, together with near-normal maximum temperatures following the hot conditions. Thundershowers are expected to be somewhat more isolated over the southern parts of the region with a better distribution mostly north of the Vaal according to current forecasts.

Overview of expected conditions over the main agricultural production areas

Except for thundershowers in the far-east and northeast initially, it will mostly be hot and dry until Monday. Upper-air perturbations and a ridging high will result in some thundershowers over much of the interior from Monday onwards. However, there is no indication yet of a change towards a pattern resulting in widespread rain in the region during the next few days.

Maize production region:

It will be hot and dry on most days until early next week, but thundershowers may occur in the far-east and north at times. It will initially be somewhat cooler as dry air invades the region from the southwest. Thundershowers may occur over the region from Monday onwards, when maximum temperatures are expected to moderate:

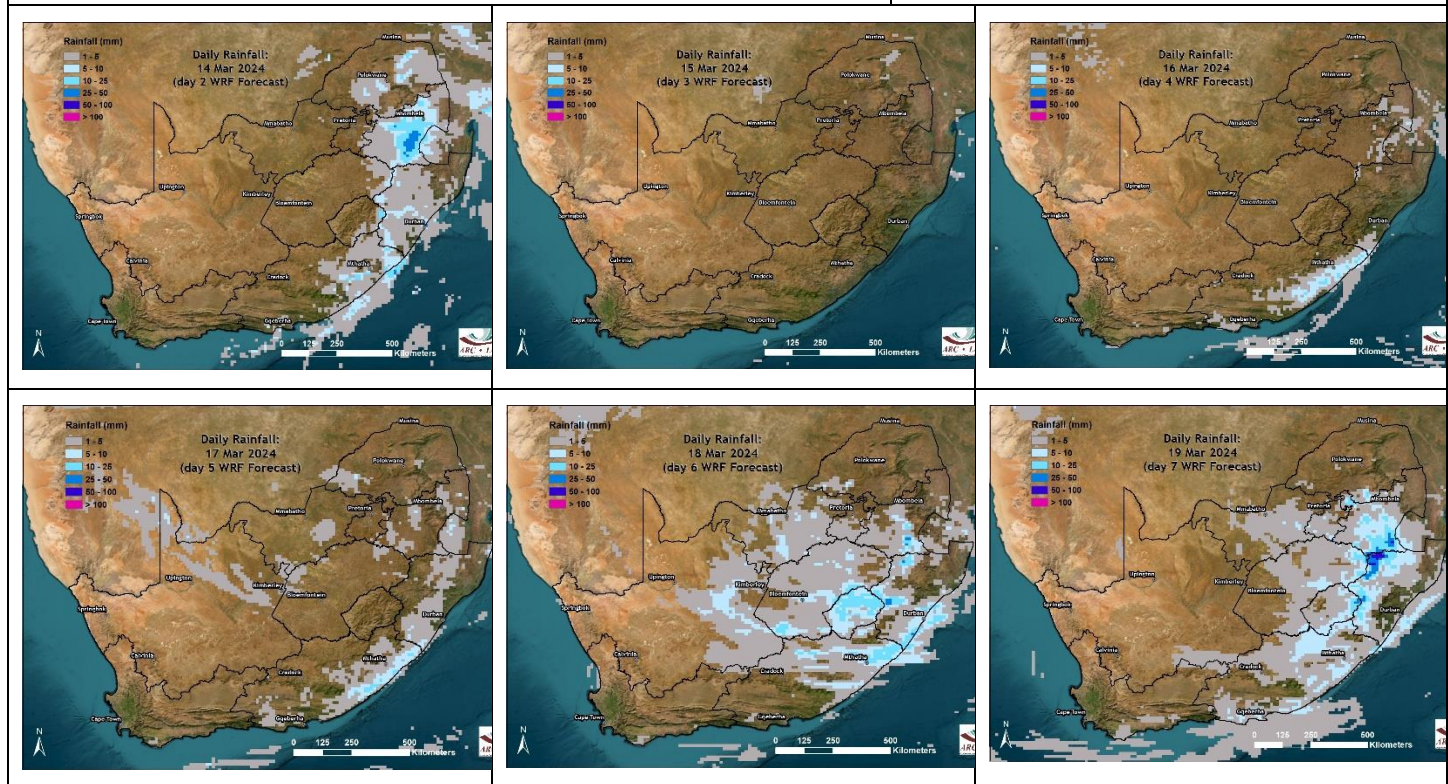
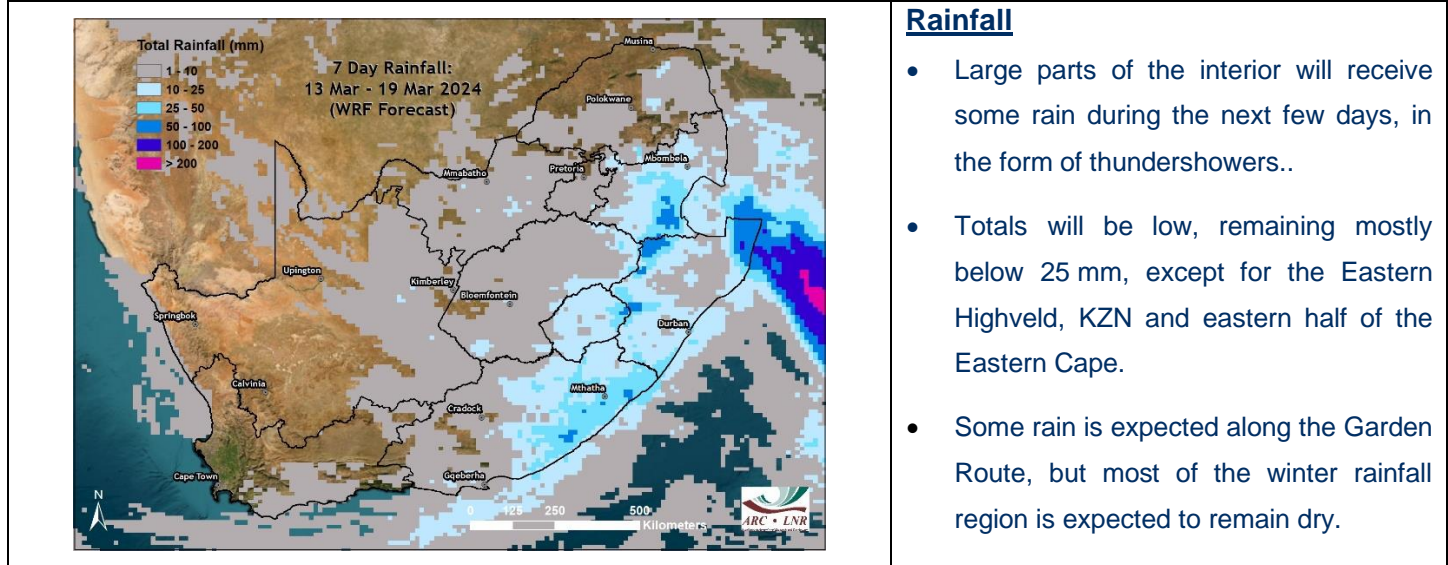
- Maximum temperatures over the western maize-production areas will range between 35 and 39°C from Friday to Monday, but in the lower 30s after Monday. Minimum temperatures will be in the order of 12 – 17°C.
- Maximum temperatures over the eastern maize-production region will be in the lower 30s, but in the mid-thirties during the weekend. Minimum temperatures will be in the order of 11 - 16°C.
- **Thursday (14th):** Partly cloudy and warm. It will be cool over the southern parts in the morning. Scattered thundershowers will occur over the far eastern parts by the afternoon, where it will be cooler.
- **Friday (15th):** Sunny, hot and windy over the central to western parts, but partly cloudy and warm in the east with isolated thundershowers in the northeast.
- **Saturday (16th):** Sunny to partly cloudy and hot, but warm in the east. It will be windy over the western to central and southern parts.
- **Sunday (17th):** Sunny to partly cloudy and hot. Isolated thundershowers are possible, mostly to the north of the Vaal.
- **Monday (18th):** Partly cloudy and hot. It will be windy over the western to central parts. Scattered thundershowers are possible in the afternoon, especially over the northern half of the region, with isolated thundershowers further south.
- **Tuesday to Wednesday (19th - 20th):** Current forecasts indicate a continuation of partly cloudy and warm conditions over the region, with afternoon thundershowers (isolated to scattered). Daytime temperatures will normalise somewhat due to cloud cover, moving to the lower thirties in contrast to the high temperatures (35 – 40°C) expected until Monday.

Cape Wine Lands and Ruens:

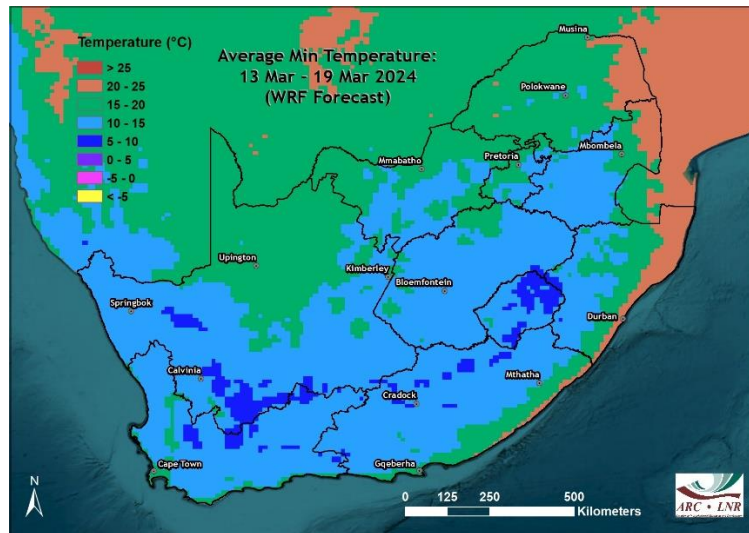
It will be partly cloudy and mild over the region, with somewhat cooler conditions expected on Saturday with light showers possible in the southwest and south as a weak cold front moves through. It will remain mild over the southern parts, with light showers along the Garden Route on Tuesday. The western to northern part (Swartland, Karoo, Namakwaland, northern half of the Boland) will be hot from Sunday onwards. Strong south-easterlies are expected over the southwestern parts from Sunday onwards.

Daily summary of expected conditions

(GFS forecast downscaled using WRF)

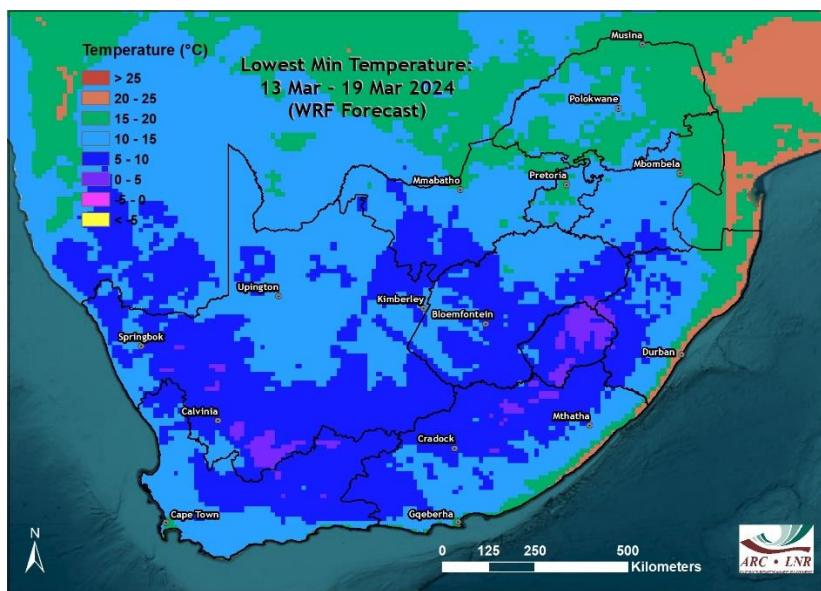


- Scattered thundershowers will occur on Thursday over far-eastern parts, mostly over central to eastern Mpumalanga and along the escarpment further south as well as the central to eastern parts of Limpopo.
- It will be dry for the most part on Friday and Saturday.
- Light showers will occur along the Garden Route on Saturday, spreading to the coast of the Eastern Cape and finally to the KZN coast early next week.
- From Sunday afternoon, and more significantly by Monday, chances for thundershowers over the interior improve.



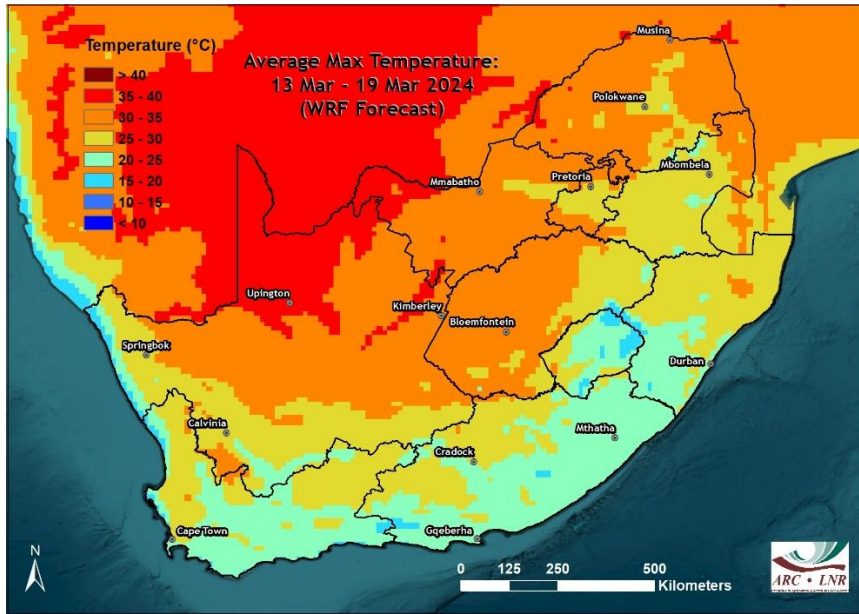
Average minimum temperatures

- Average minimum temperatures over the interior will range between 10 and 15°C.
- Average minimum temperatures will exceed 20°C over the eastern coastal areas, Lowveld.



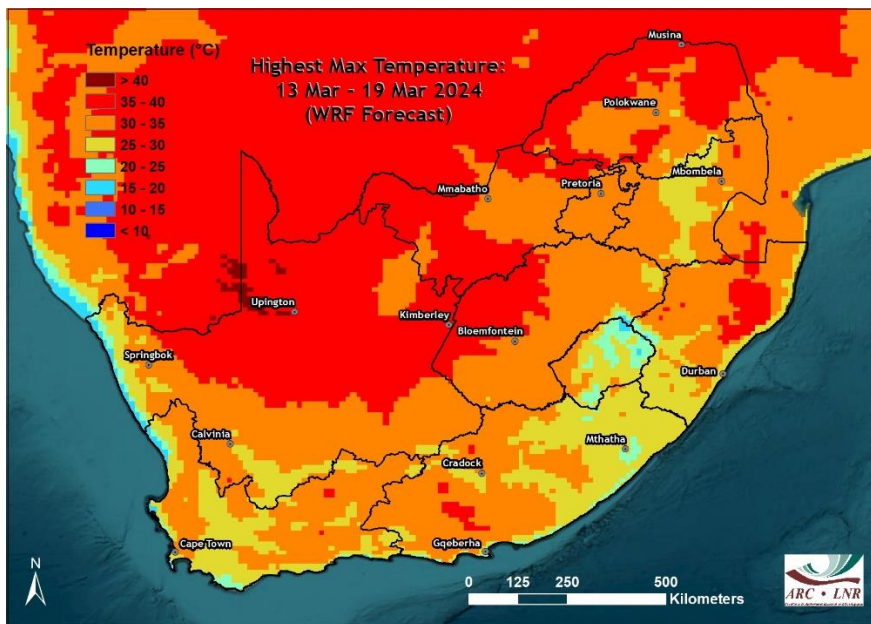
Lowest minimum temperatures

- Lowest minimum temperatures will remain above 5°C over the summer grain production region.
- Lowest minimum temperatures will be below 5°C over the southern escarpment and parts of Lesotho.



Average maximum temperatures

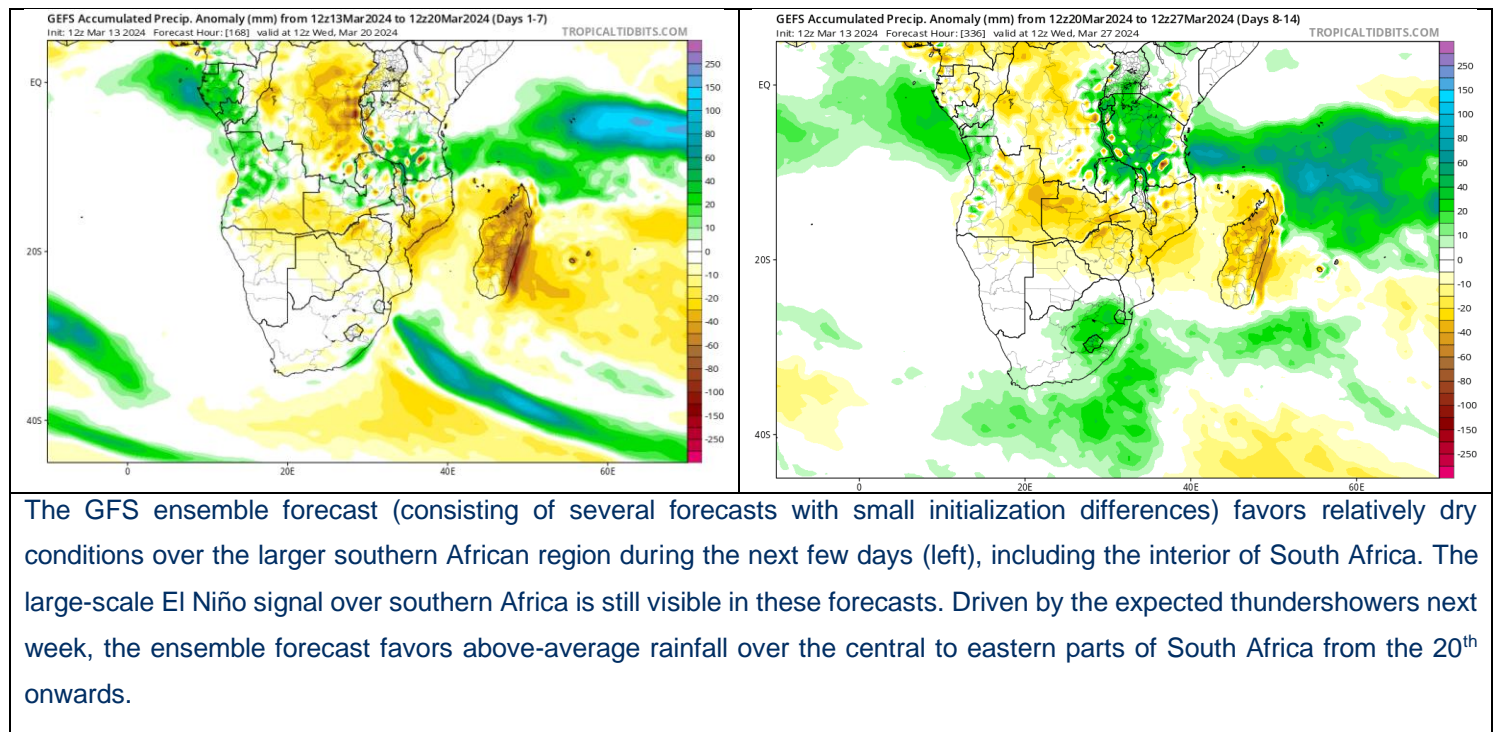
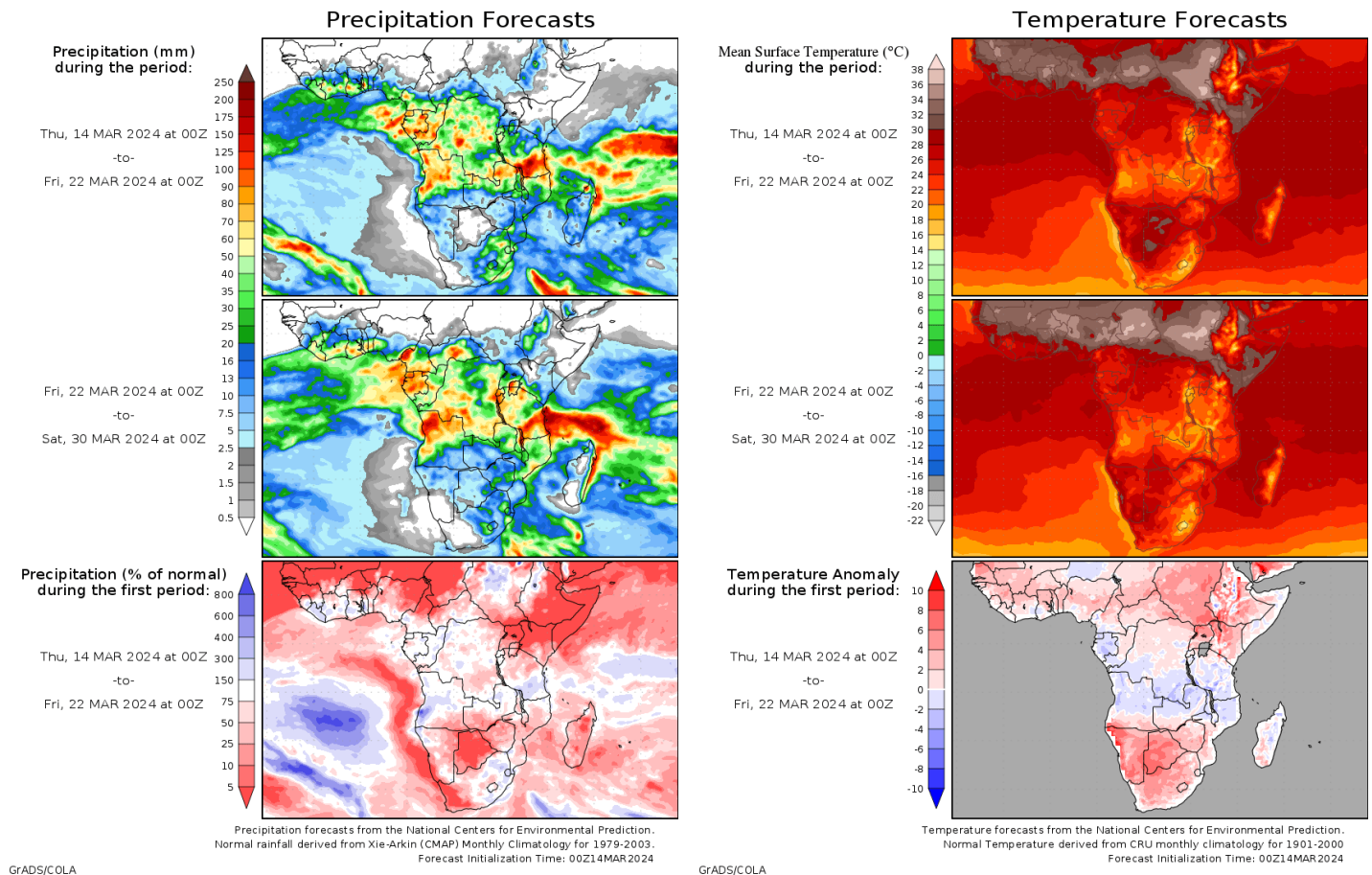
- Average maximum temperatures will be above 30°C over the central to northern and northeastern interior.
- Average maximum temperatures will exceed 35°C over the far northern parts, Limpopo River Valley and northern parts of the Northern Cape.



Highest maximum temperatures

- Most of the interior will experience hot conditions at times during the next few days.
- Highest temperatures during the next few days will exceed 35°C over most of the central to northern parts, northeastern KZN and parts of the Karoo.

Medium term rainfall and temperature summary



Possible extreme conditions - relevant to agriculture

The South African Weather Service issues warnings for any severe weather that may develop, based on much more information (and in near-real time) than the output of only 2 weather model (GFS and the ECMWF model) considered here in the beginning of a week-long (starting 14 March) period. It is therefore advised to keep track of warnings that may be issued by the SAWS (www.weathersa.co.za) as the week progresses.

According to current model projections (GFS / ECMWF models) of weather conditions during the coming week, the following may negatively affect agricultural activities and production:

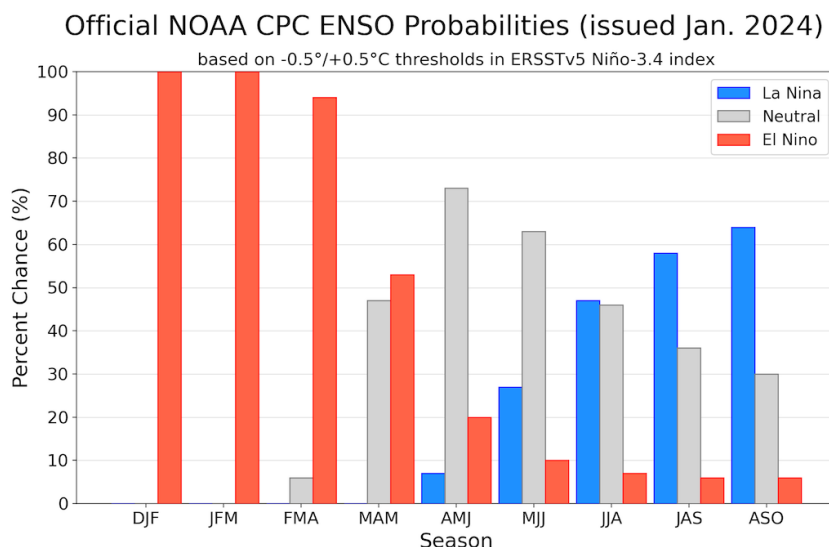
- **It will be hot and humid:**
 - Limpopo River Valley: **Thursday to Sunday (14th – 17th) and Tuesday to Wednesday (19th – 20th).**
 - Lowveld: **Thursday, Saturday and Tuesday (14th, 16th, 19th).**
 - Central to northern and eastern KZN: **Saturday (16th).**
- **It will be hot:**
 - Northern half of the Northern Cape: **Friday to Wednesday (16th to 20th).**
 - Southern parts of the Northern Cape: **Friday to Wednesday (16th to 20th).**
 - North West: **Friday to Monday (16th to 18th).**
 - Northern to western and central Limpopo: **Thursday to Sunday (14th – 17th) and Tuesday to Wednesday (19th – 20th).**
 - Gauteng: **Saturday to Sunday (16th to 17th).**
 - Central, southern to western and northern Free State: **Friday to Monday (15th – 18th).**
 - Eastern Free State: **Saturday to Sunday (16th – 17th).**
 - Central to northern and eastern KZN: **Saturday (16th).**
 - Northern to western parts of the winter rainfall region: **Sunday to Wednesday (17th – 20th).**
 - Karoo (Western and Eastern Cape): **Friday, Monday and Wednesday (15th, 18th, 20th).**
 - Eastern Cape interior: **Saturday (16th).**
- **It will be warm to hot and dry and generally windy, enhancing the fire hazard where vegetation is dry:**
 - Western to southern, southeastern and central interior: **Thursday to Monday (14th to 18th).**
 - Northern to western parts of the winter rainfall region: **Saturday to Sunday (16th to 17th).**
 - South-western parts of the winter rainfall region: **Sunday to Wednesday (17th to 20th).**
- **Some thundershowers may become severe:**
 - Northern to western KZN, central to eastern Mpumalanga and central to eastern Limpopo: **Thursday (14th).**
- **Persistent hot and dry conditions may result in certain diseases such as Diplodia stalk rot on maize:**
 - Summer-grain production region where widespread rain occurred until mid-January, followed by dry and hot weather present currently – mostly central to western summer grain production region.

Seasonal forecast

Current ENSO conditions:

The current El Niño has peaked and ENSO forecast models predict a weakening of the event so that the Sea Surface Temperature Anomaly patterns will resemble neutral conditions by autumn and winter. Some models lean towards La Niña conditions by our next summer, which will not be uncharacteristic based on historical observations of conditions following an El Niño summer. However, ENSO forecasts are usually only found to be reliable from July onwards, so there is still great uncertainty in the outlook.

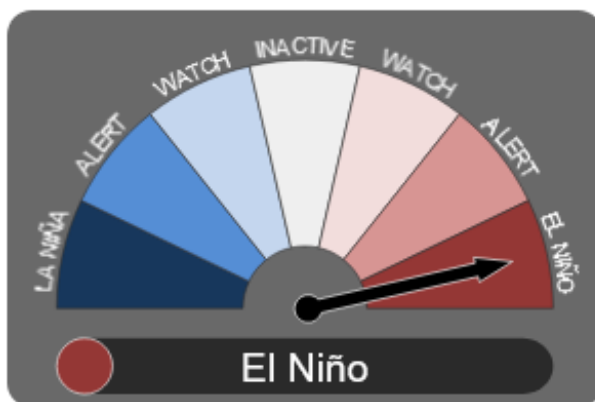
The International Research Institute for Climate and Society (IRI)'s latest ENSO forecast however maintains the expectation of a continuation of El Niño, at least in terms of Sea Surface Temperatures, into autumn:



International Research Institute for Climate and Society- <http://iri.columbia.edu/>

Likewise, the Australian Bureau of Meteorology keeps their outlook to “El Niño”

El Niño persists



Australian Bureau of Meteorology - <http://www.bom.gov.au>

In their most recent update (issued 19 February), the IRI notes the “As of mid-February 2024, moderate-strong El Niño conditions persist in the central-eastern equatorial Pacific, with important oceanic and atmospheric indicators aligning with an ongoing El Niño event that is gradually diminishing. An El Niño advisory from the CPC continues for February 2024, alongside a La Niña watch issued for June to August 2024. Almost all the models in the IRI ENSO prediction plume forecast a continuation of the El Niño event during the rest of the boreal winter and spring of 2024, which rapidly weakens thereafter. ENSO-neutral conditions become the most likely category in Apr-Jun, and May-Jul of 2024. For Jun-Aug 2024, no single category stands out as dominant, with ENSO-neutral and La Niña being almost equally likely. By Jul-Sep 2024, La Niña becomes the most probable category”....
<https://iri.columbia.edu>

In their most recent update (5 March), the Australian Bureau of Meteorology states that “El Niño persists, although a steady weakening trend is evident in its oceanic indicators. Climate models indicate sea surface temperatures in the central tropical Pacific are expected to continue declining and are forecast to return to ENSO-neutral in the southern hemisphere autumn 2024.

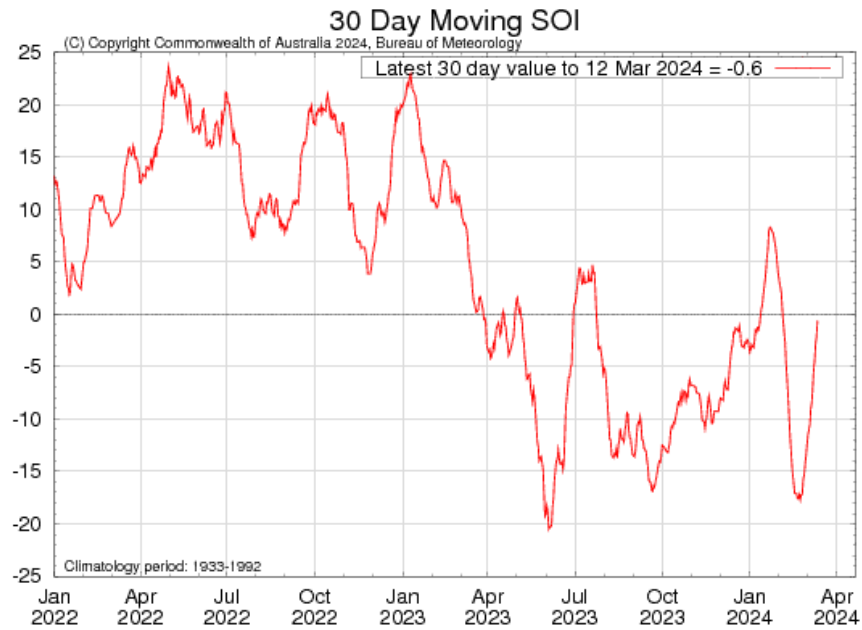
Atmospheric indicators are mixed but are consistent with a steadily weakening El Niño. Cloudiness near the equatorial Date Line has decreased over the last fortnight, returning to the climatological average. The 30-day Southern Oscillation Index (SOI) is currently less than -7.0, characteristic of an El Niño state, but indicative of ENSO-neutral conditions over the 60- and 90-day periods. Temporary fluctuations of ENSO atmospheric indicators are common during summer and are not an indication of El Niño strength.

International climate models suggest the central tropical Pacific Ocean will continue to cool in the coming months, with four out of seven climate models indicating the central Pacific is likely to return to neutral El Niño–Southern Oscillation (ENSO) levels by the end of April (i.e., neither El Niño nor La Niña), and all models indicating neutral in May. ENSO predictions made in autumn tend to have lower accuracy than predictions made at other times of the year. This means that current forecasts of the ENSO state beyond May should be used with caution.

Based on the historical record from 1900, around 50% of El Niño events have been followed by an ENSO-neutral year, and 40 to 50% have been followed by La Niña. However, global oceans have warmed significantly over the past 50 years. The oceans have been the warmest on record globally between April 2023 and January 2024. These changes may impact future predictions of ENSO events, if based solely on historical climate variability.

The Southern Annular Mode (SAM) is currently neutral, as of 3 March. Forecasts indicate SAM will remain neutral over the coming fortnight”... - <http://www.bom.gov.au>.

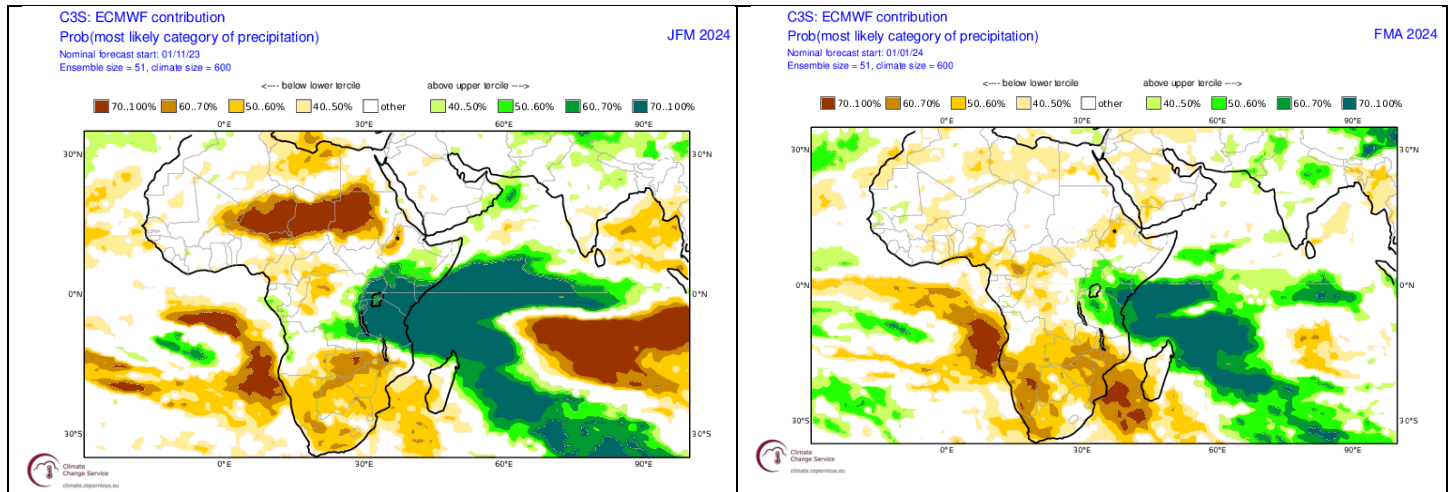
The 30-day Southern Oscillation Index (SOI) is currently -0.6 and therefor indicative of atmospheric pressure patterns in the Australia – Pacific region being in neutral mode. This is and indication of a weakening of the current El Niño.



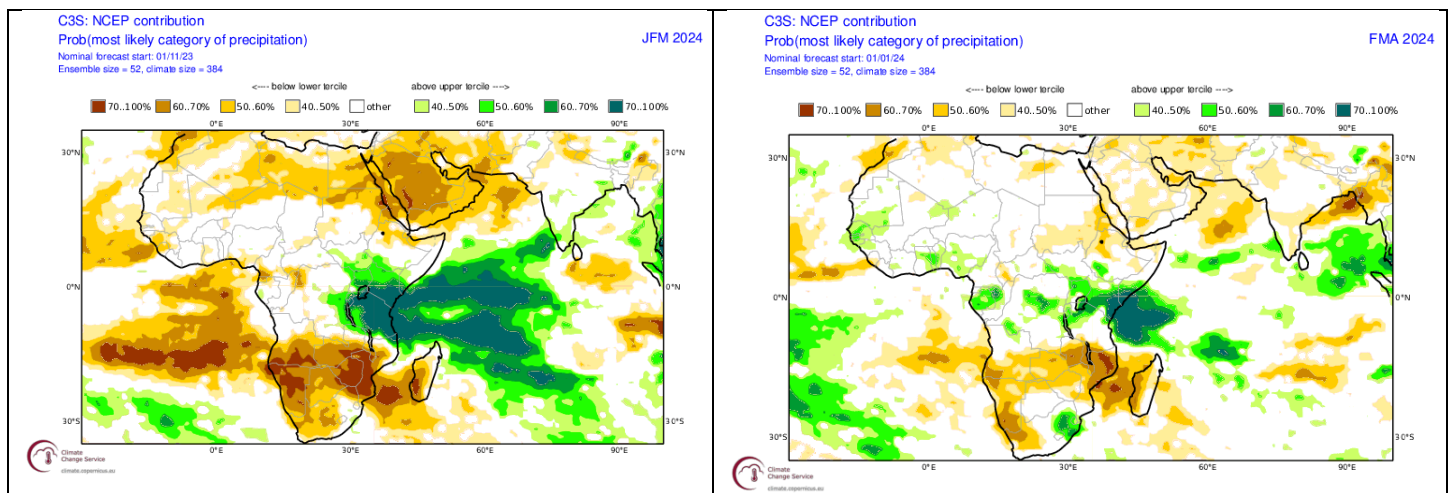
Australian Bureau of Meteorology - <http://www.bom.gov.au>

Seasonal forecasts issued by various international institutions

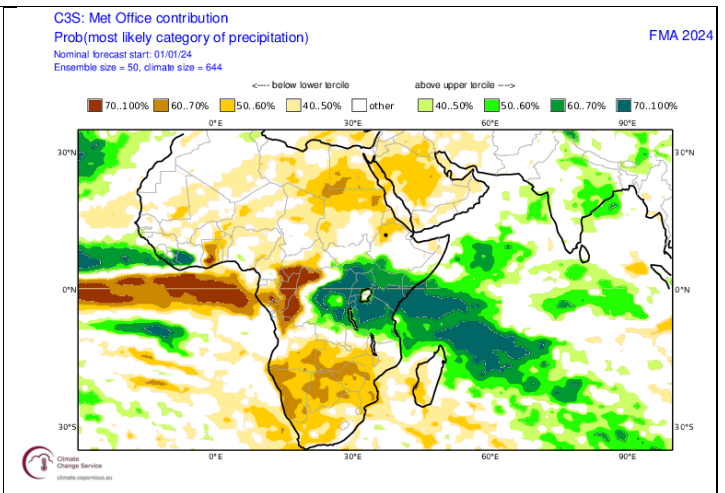
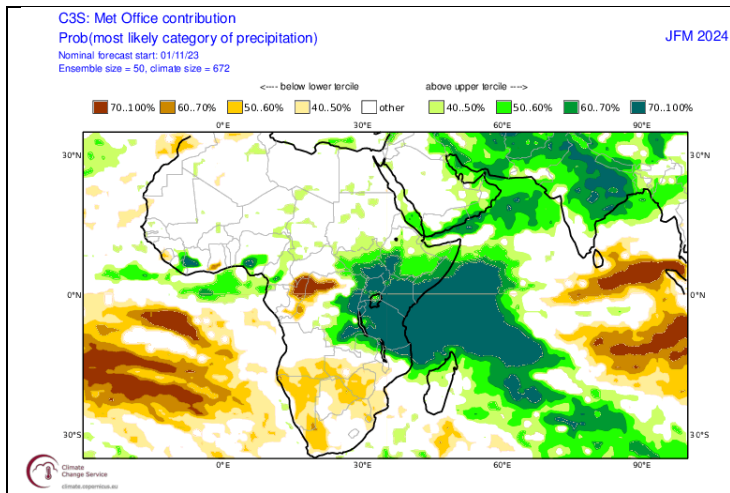
Seasonal forecasts (updated in January 2024) by various institutions, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) and by the IRI, still expect drier conditions for the remainder of summer. The drier pattern expected across most of southern Africa is to be expected with regard to seasonal forecasts given the current El Niño event. Forecasts still lean more strongly towards drier than normal conditions over the central to western parts of the country with the somewhat wetter or near normal signal over the eastern parts.



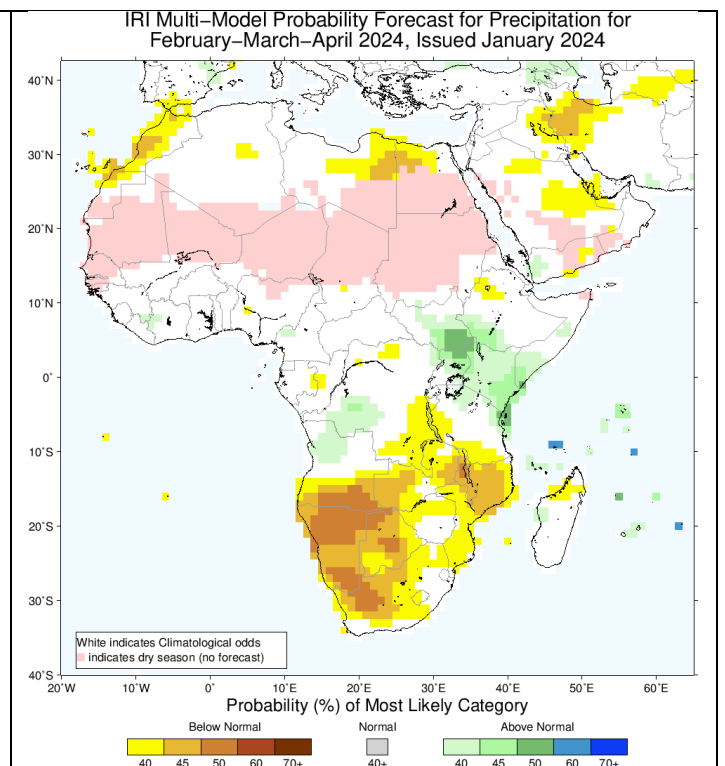
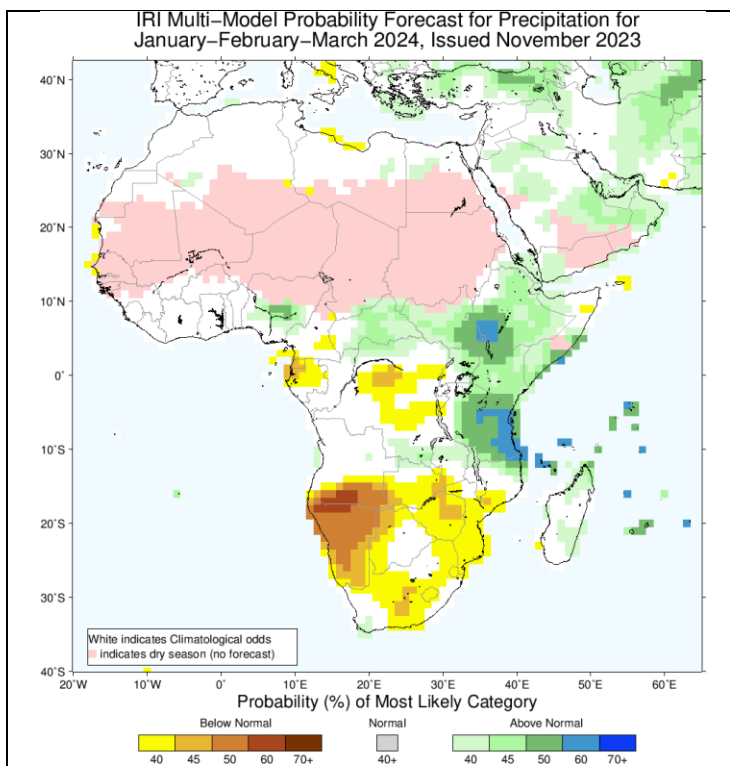
Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for mid-to-late summer (January-March 2024; left - Forecast issued in 2023-11; and for late summer (February to March 2024 right – Forecast issued in 2024-01).



Same as above, but forecasts issued by the National Centres for Environmental Prediction.



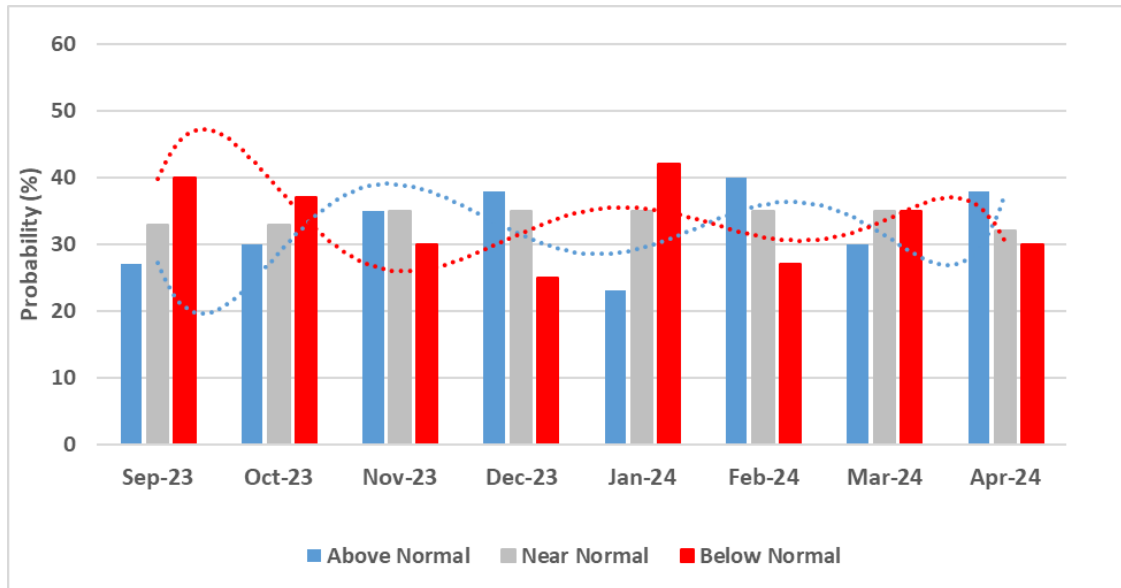
Same as above, but forecasts issued by the UK Met Office.



Probabilistic forecasts by the International Research Institute for Climate and Society (IRI) for rainfall for mid-to-late summer (January-March 2024; left - Forecast issued in 2023-11) and late summer (February to April, right – Forecast issued in 2024-01).

CUMULUS seasonal outlook

This outlook is based on the typical observed rainfall patterns over the **north-eastern half** of the country (including most of the summer grain production region), as associated with the cyclic variability of the global climate system. Summers that are similar to 2023/24 usually experience near normal to below normal rainfall in total, with alternating wet and dry periods throughout the summer rather than one half of the summer being dry while the other half is wet.



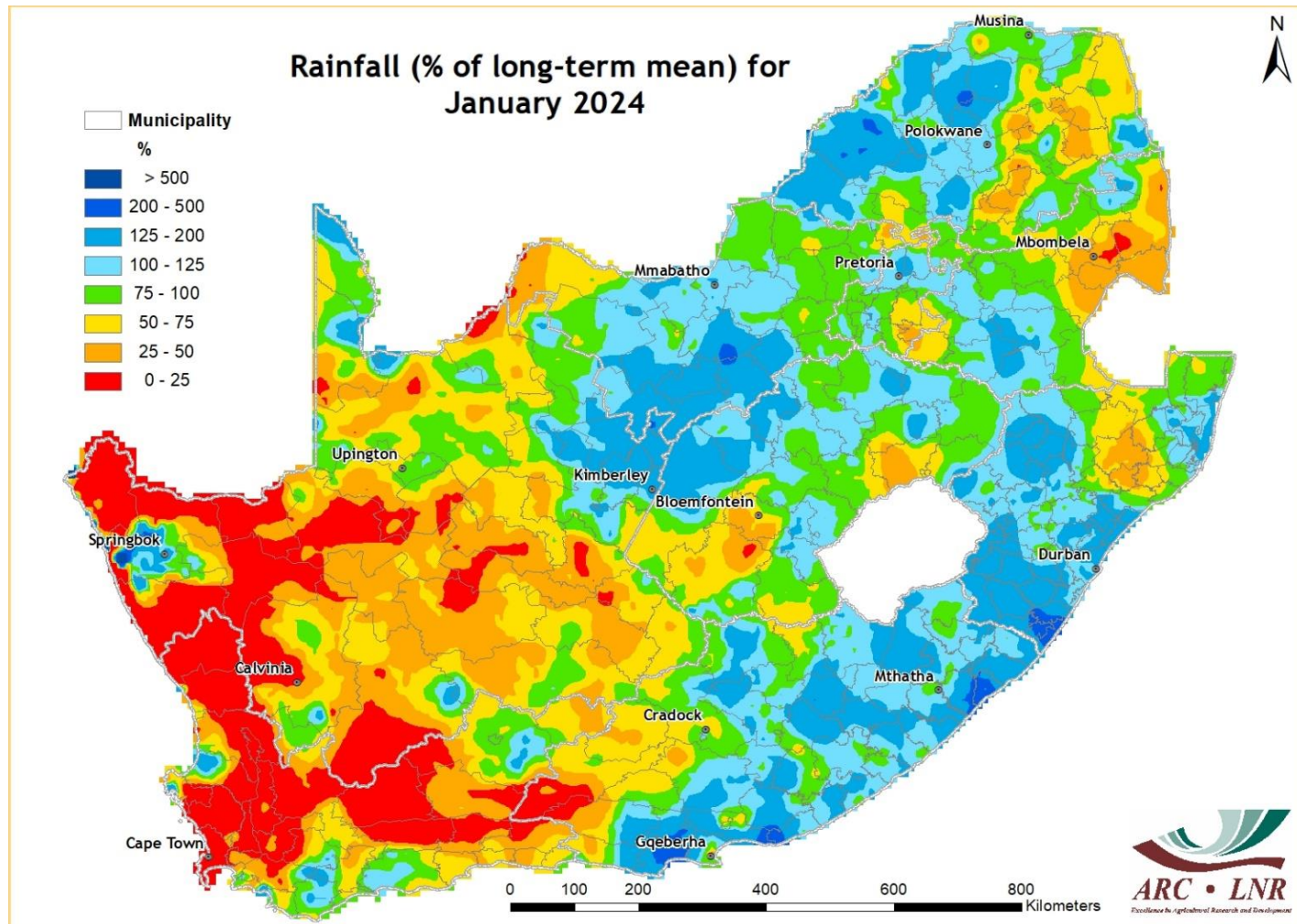
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2023 – April 2024 (Forecast issued in 2023-09).

Typical patterns during similar summers, over the north-eastern half of the summer rainfall region, are:

- September – first half of October: Relatively dry conditions over the north-eastern half of the summer rainfall region
- Second half of October – early November: Near-normal rainfall over the north-eastern half of the summer rainfall region
- First half of November: Near-normal to below-normal rainfall over the north-eastern half of the summer rainfall region
- Late November and December to early January: Above-normal rainfall over the north-eastern half of the summer rainfall region
- Rest of January: Below-normal rainfall over the north-eastern half of the summer rainfall region
- February: Normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- Late February and early March: Below-normal rainfall over the north-eastern half of the summer rainfall region
- Late March into Early April: Normal to above-normal rainfall over the north-eastern half of the summer rainfall region

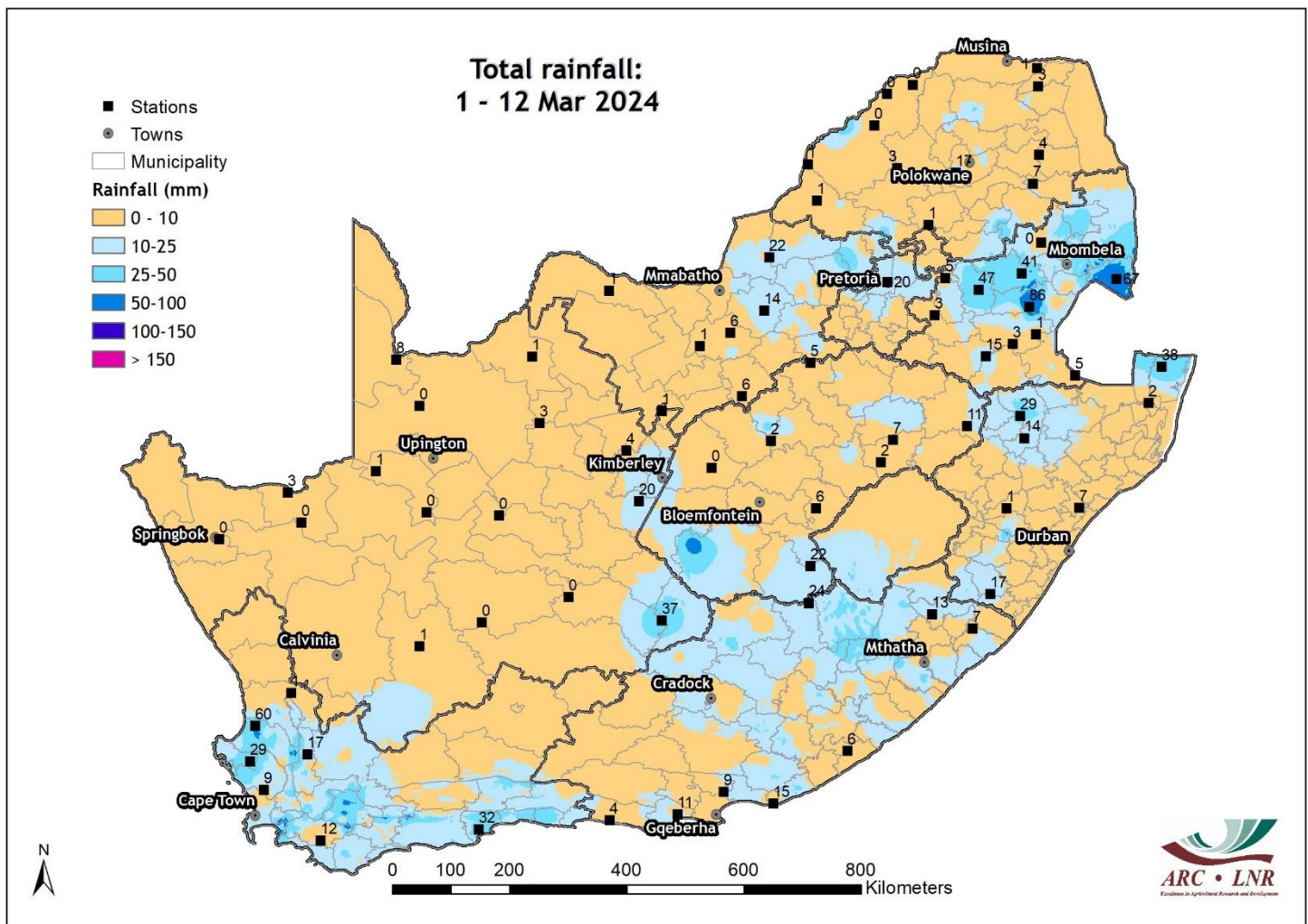
Observed conditions

Rainfall (% of long-term mean): January 2024



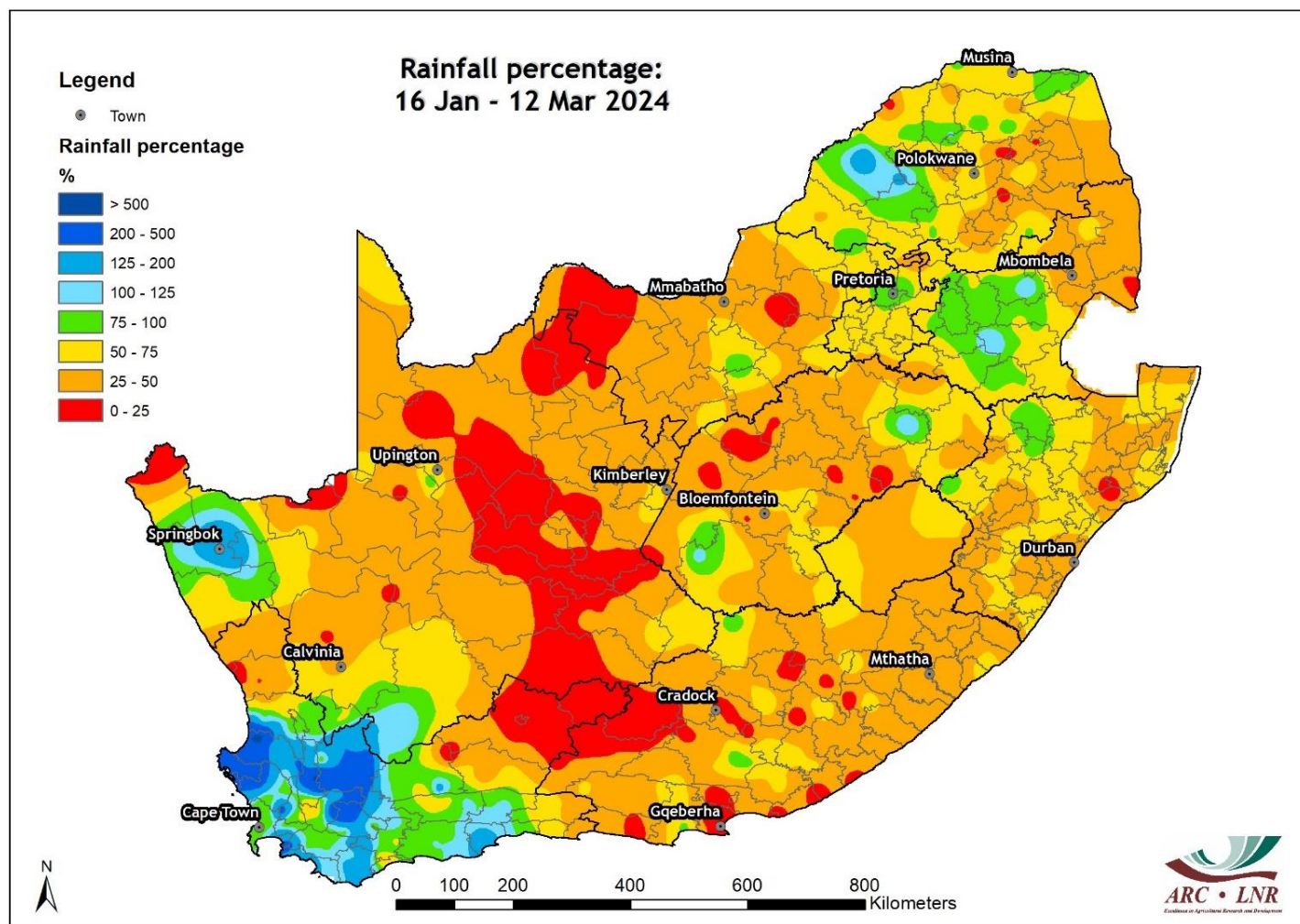
Most of the country received near to above-average rainfall during January in total. Most of the rain over the interior occurred before the middle of the month. Parts of the northern to eastern Free State and southern Mpumalanga received below-average rainfall.

Rainfall (mm): 1 – 12 March 2024



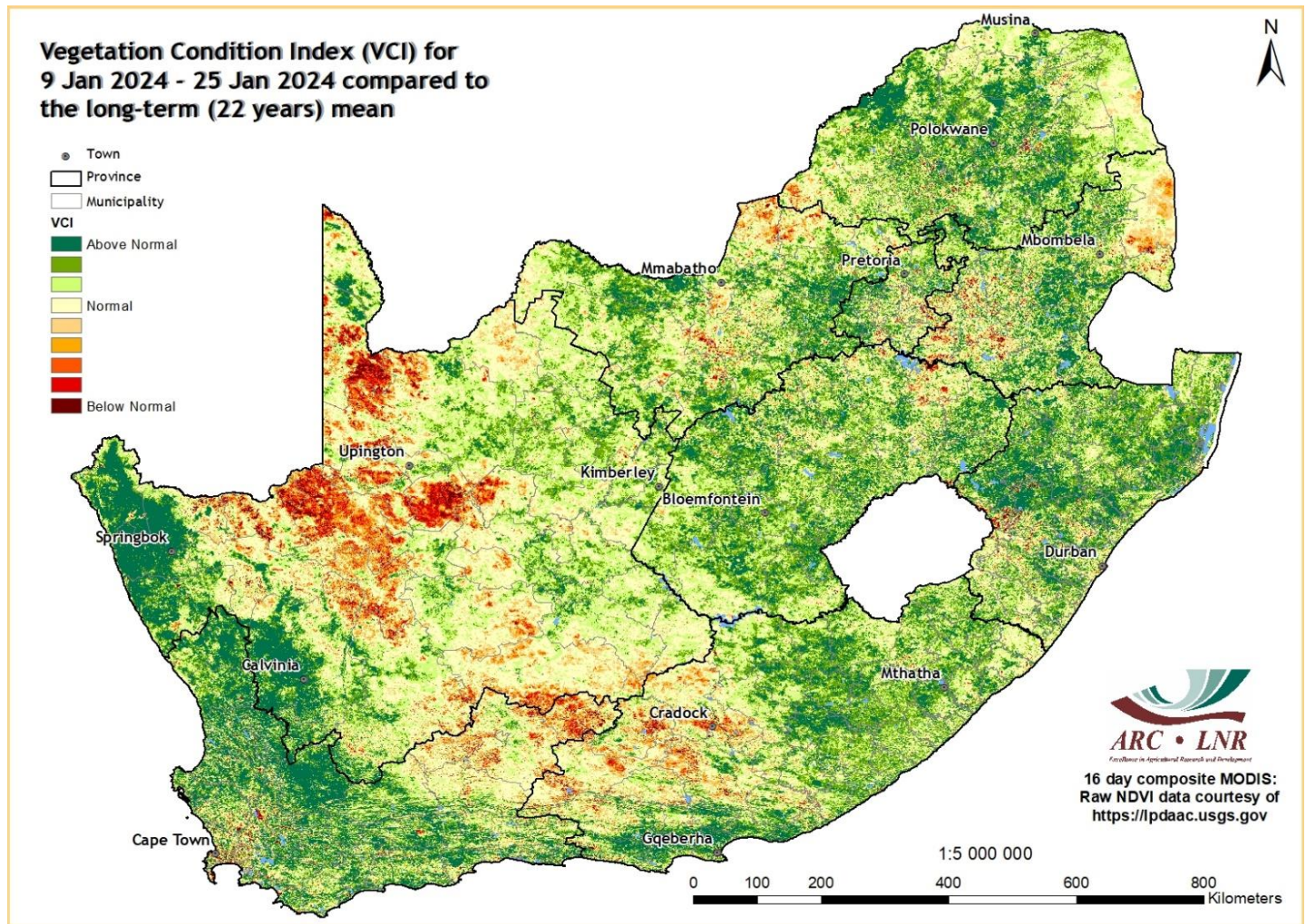
So far very little rain has fallen in March. Most of the summer-grain production region received less than 10 mm of rain during this period. The northern to eastern half of Mpumalanga saw some more significant totals. Rainfall over the southern parts of the Lowveld and far-northeastern KZN was in part associated with Tropical Storm Filipo.

Rainfall (% of Long-term mean): 16 January – 12 March 2024



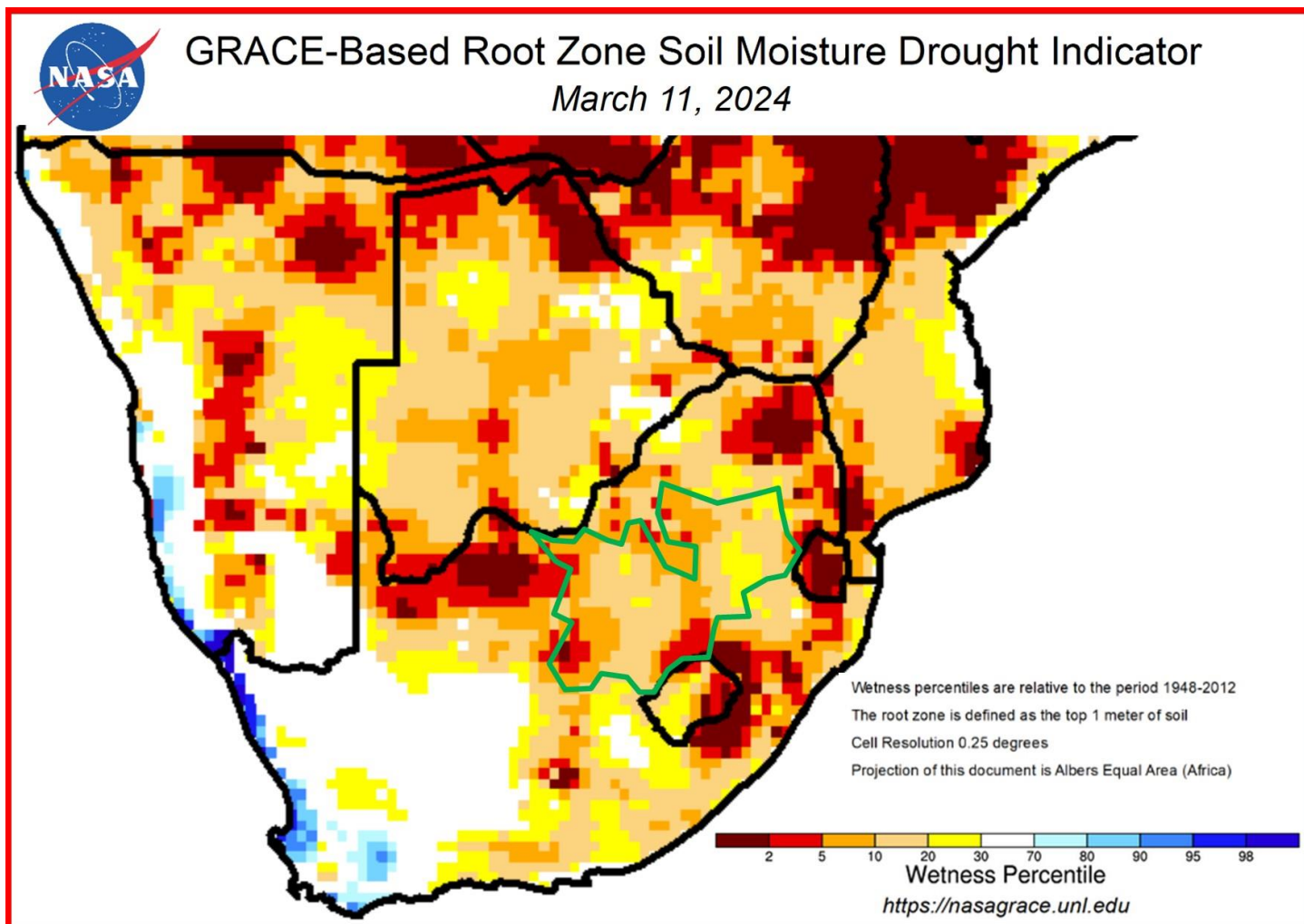
Total rainfall was relatively low over the central to western interior since mid-January. Most of the central to western interior received less than 50% of the long-term average for this time of the year. Some areas received less than 25% of the long-term average. Isolated areas in the northeast received near-average rainfall while most of the winter rainfall region and western half of the Garden Route received above-average rainfall.

Vegetation Condition Index: Late January 2024



By late January, below-normal vegetation activity was confined to the Northern Cape, small areas of central to northern North West, the Lowveld of Mpumalanga and parts of the Karoo. Vegetation activity was above normal over most of the rest of the country.

Soil moisture conditions



The Root Zone (top 1 meter) Drought Indicator shows that soil moisture remains below normal (between the 20th and 2nd percentile) for this time of the year (by 11 March) over large parts of the summer-grain production region (indicated on the map) following drier conditions since mid-January.

Data / maps available at nasagrace.unl.edu through a partnership with the National Drought Mitigation Center.

Sources of information

Seasonal forecasts: Published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>)

Rainfall, temperature and wind maps over South Africa for the past week:

Agricultural Research Council - Institute for Soil, Climate and Water (ISCW) – Climate Data Bank. Data recorded by the automatic weather station network of the ARC-ISCW.

Vegetation condition maps: Copernicus Global Land service, distributed by VITO.

Information related to: ENSO, IOD and SOI:

Australian Bureau of Meteorology - <http://www.bom.gov.au>

Climate Prediction Center - <http://www.cpc.ncep.noaa.gov>

International Research Institute for Climate and Society- <http://iri.columbia.edu/>

Information related to the SAM:

The Annular Mode Website - <http://www.atmos.colostate.edu/ao/index.html>

SST map:

NOAA Climate Prediction Center - <http://www.cpc.ncep.noaa.gov>

Daily conditions over South Africa:

WRF model downscalings of GFS forecasts.

Fires:

MODIS data, distributed by the Land Processes Distributed Active Data Center (LP DAAC), located at the US Geological Survey's EROS Data Center

Soil moisture:

<https://nasagrace.unl.edu/>

Precipitation and temperature outlooks for the coming week:

Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES) – <http://Wxmaps.org>

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The way in which **young people see the future** speaks of a positive attitude – and of the choice to be relevant in a new era. AgriSeker shares this excitement about the future of agriculture in South Africa. Our motto is 'A **certain future**,' after all.

AgriSeker is motivated to make a contribution to the future of our country with a dedicated focus on agriculture through knowledge, understanding and participation in this sector. Our focus is on producers and young people, because for agriculture to survive, we need you.

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